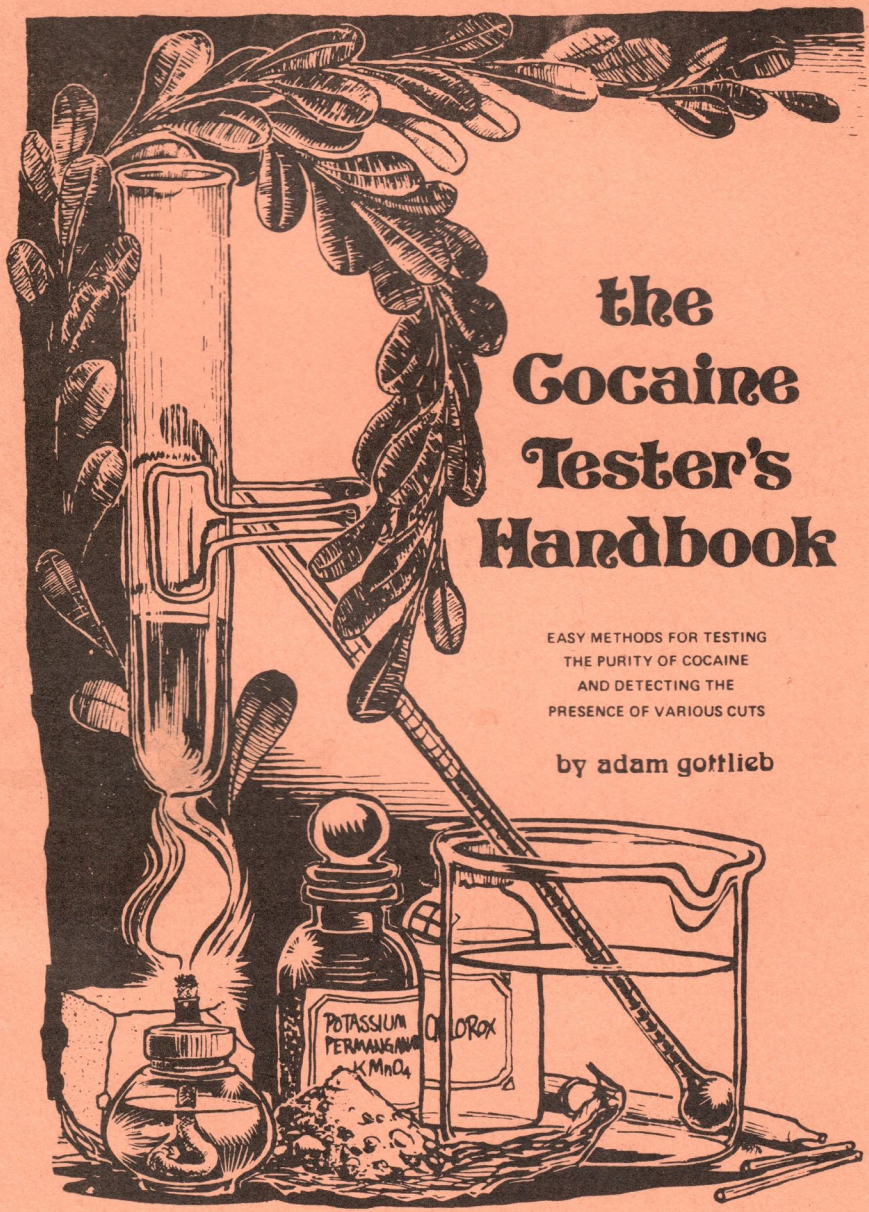

the Cocaine Tester's Handbook

EASY METHODS FOR TESTING
THE PURITY OF COCAINE
AND DETECTING THE
PRESENCE OF VARIOUS CUTS

by adam gottlieb

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INTRODUCTION

At one time Alcohol Prohibition created circumstances in which the unscrupulous could make a fortune poisoning the public with wood alcohol. History now repeats itself. Most cocaine consumers have no means of determining the purity of a black market product or finding out what foul substances have been added as cuts. This book serves as a handy and inexpensive guide for customers and responsible dealers who want to know exactly what they are buying or selling. It explains how a person may estimate the purity of a cocaine sample and determine how much of what substance has been used to cut it. We begin by showing what can be discerned initially by examining, tasting and snorting the product. Next we progress to a series of simple tests which can be conducted with items found in any kitchen, but which can divulge a great deal about the contents of the coke. Then we describe each of the individual substances commonly used as cocaine cuts plus some less common ones. Under each heading we give all of the pertinent information that the consumer or dealer needs to know: what the substance is; its effects on the user; and essential testing data such as melting point, solubility, flame test response and reactions to other tests described in this book. Also given under each heading is a simple but specific test for positively identifying that substance. We also give three tests for cocaine itself; one to detect its presence, another to determine its purity, and a third to distinguish pharmaceutical from mixed alkaloidal cocaine.

The information in this book is expressed simply and clearly in language that can be understood by the layman. With this book the customer or dealer should be able to select the highest quality cocaine available and save many dollars as well as his health.

We present the information in this book because the right of access to knowledge is guaranteed under the First Amendment to the Constitution of the United States of America. How the reader chooses to use this knowledge is his own business. We are not trying to encourage the use of cocaine and feel that it is our duty to remind the reader that one of that drug's gravest dangers is that it is a felony to possess it without license in the USA and many other countries.

A.G.
July 4, 1976

ABOUT COCAINE

Cocaine is one of several alkaloids derived from the leaf of the coca bush (*Erythroxylon coca*) of the Andes region of South America. After extraction it is converted into a salt – usually the hydrochloride. It is a powerful central and cerebral stimulant. It usually occurs as white (sometimes pink-tinted) crystalline rocks, flakes or powder. There is no difference in potency between any of these forms. It has a slightly bitter taste with a faintly medicinal aftertaste followed by a numbing of the tongue. Either of two types of cocaine are likely to be encountered: 1.) pharmaceutical grade cocaine, for use as a local anesthetic, and 2.) mixed alkaloidal cocaine – sometimes called refined cocaine – which is the mixed hydrochlorides of cocaine and its companion alkaloids in the proportions that they natively occur in the leaf. Many users prefer the latter type because these other alkaloids tend to mellow the stimulation of the cocaine. Black market cocaine may come as any of the above types and forms, but is most often cut with 20-50% of some inexpensive substance. The percentage and nature of the adulterant largely depends upon the ethics of the dealer and the number of middlemen through whose hands the product has passed. Although cocaine is a benzoic acid ester of the base ecgonine it does not respond positively to the bleach water test like the synthetic benzoic esters procaine, benzocaine, etc. It is soluble in water, ethanol, methanol, chloroform, and acetone; and insoluble in ether, and benzene. On a flame test pharmaceutical cocaine produces ignitable fumes and leaves virtually no residue; mixed alkaloidal cocaine leaves a reddish-brown stain on the foil. Pure cocaine hydrochloride's m.p. (melting point) is 192 -197 degrees C. The presence of other alkaloids and/or cuts can cause the m.p. to vary widely. Chemical tests for the presence and purity of cocaine are given later in this book.

LOOKING

The first thing a cocaine purchaser will do is look at the product. What can he determine from visual examination? Not much! Most cuts blend very well with cocaine, especially if the product contains a lot of duff (cocaine that has been crushed to powder through handling). To make matters more difficult many coke suppliers will combine the cocaine and the adulterant in solution and reconstitute it by evaporation. The result is what appears to be beautiful solid chunks of rock cocaine or – if the evaporation technique is varied – perfect flakes. These methods have fooled some of the most sophisticated connoisseurs. Except for cases where the adulterant's appearance is radically different than that of cocaine there is little that can be determined with the naked eye. Microscopic examination may reveal more. Cocaine crystals have their own structures and patterns. So does each of the adulterants. Careful examination with a powerful microscope and experienced familiarity with the crystalline structures of all of these substances is necessary to make such determinations.

TASTING

The next thing a purchaser will do is put some of the product on his tongue. The best way to do this is to place a flake or crystal between the tongue and the roof of the mouth. If it melts like butter leaving no gritty residue, it may be fairly pure. There are some adulterants, however, that melt as easily as cocaine. Mannite is one of them. Its mild sweetness should be detectable though. Also it cools slightly in the mouth for a few seconds after it becomes moist. This is not to be confused with the freeze effect of cocaine and the synethetic anesthetics, which is actually a numbing of the sensory nerves. Inositol also has a mild sweetness, and lactose is even sweeter, but less so than dextrose and sucrose. Cocaine has a somewhat bitter and slightly medicinal taste. It numbs the tongue a few minutes after tasting it. If the bitterness is lacking, it may be cut with one of the sweet adulterants. The synethtic anesthetics have a bitter taste also, but lack the characteristic medicinal aftertaste of cocaine. They also numb the tongue, but more swiftly than cocaine. Some dealers balance their cuts to fool the taster. One might, for instance, dilute the product with an inert cut such as mannite, then restore the anesthetic potency to that of cocaine by adding some procaine. Finally, to completely delude the customer, he may mix in some cheap stimulant such as methedrine, ephedrine, or pemoline. The author has seen coke that contained nothing but speed, procaine and mannite with not a single molecule of cocaine. A gram of this is worth about 80 cents, but may sell for 80 dollars.

SNORTING

The third thing a purchaser will do is snort some of the product to see if the high is a good coke high. If a line or two does not fully stimulate as would be expected of this much cocaine, it has obviously been cut with some inert substance or with a non-stimulating anesthetic cut. If there is stimulation, but it is of the jagged sort accompanied by tightness in the facial muscles, it has no doubt been cut with methedrine.

KITCHEN TESTS

Many sophisticated purchasers are familiar with several simple tests that can be accomplished anywhere with materials found in any household. These include the water glass test (sometimes called the trailer test), the bleach test, and the flame test. These are excellent tests if properly understood. But unfortunately there is an abundance of devoutly believed misconceptions concerning their indications.

WATER GLASS AND BLEACH TESTS

If a pinch of cocaine is dropped on the surface of a glass of water, the particles will sink to the bottom leaving transparent trailers behind them. It is popularly believed that only cocaine will do this and that this is a sure test for purity. But procaine hydrochloride will do exactly the same thing.

However, the distinction between cocaine hydrochloride and procaine hydrochloride can be made by adding a tablespoonful of liquid bleach (Clorox®, Purex®, etc.) to the water. The particles and trailers of procaine hydrochloride will turn brick-red or orange whereas those of cocaine will not. All of the synthetic benzoic esters will turn this color in bleach water. These include both free bases and salts of procaine, butacaine, tetracaine, and benzocaine; but not lidocaine, because it is not a benzoic ester.

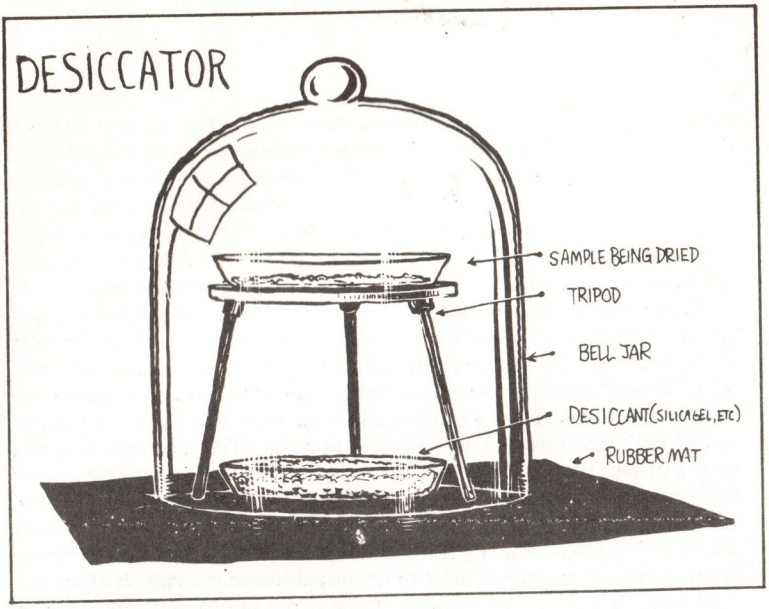
Substances which are insoluble or poorly soluble in water will not sink to the bottom of the glass, but will linger on the water's surface. These include free bases of procaine, butacaine, tetracaine, benzocaine, and lidocaine, as well as talc, pemoline, yohimibine hydrochloride and quinine sulfate. If the free base of a synthetic benzoic ester is dropped into bleach water, the color reaction will be slow to occur. The substance will float on the surface for a while before turning pale yellow and gradually deepening into more orangish hues. Eventually the particles which have reacted with the bleach and turned color will become more soluble and sink to the bottom. A quicker way to test for the presence of a free base synthetic benzoic ester is to place a drop of undiluted bleach on a pinch of the product and rub it into the powder. If one is present, it will turn brick-red immediately.

The water glass test combined with the bleach test is also quite good for making rough estimates of the percentage of cuts. Let us suppose that the sample contains cocaine hydrochloride, procaine hydrochloride, and pemoline. A pinch of it is dropped into a tumbler of bleach water. The particles begin to separate. The cocaine and procaine sink; the former leaving clear trailers and the latter leaving orange ones. Observe the approximate proportions of each. Then observe how much of the insoluble, shimmering pemoline remains on the surface. By studying the information in the section describing individual adulterants one can make similar estimates when other substances are the cuts.

SOLVENT TEST

In a sense the water glass test described above is a solvent test. Substances soluble in water will dissolve as they submerge, while substances insoluble in water will float on the surface without dissolving. Cocaine hydrochloride is soluble in certain solvents such as water, ethanol, methanol, chloroform, and acetone. It is insoluble in ether and benzene. For each cut there are solvents in which that cut is soluble and others in which it is not. Let us assume that the cocaine has been cut with inositol. This substance is insoluble in absolute ethanol, absolute methanol, and chloroform. A solvent test is conducted as follows.

1. Dry more than a gram of the coke sample overnight in a desicator over magnesium sulfate. This removes traces of moisture that would throw off the weight accuracy as well as the solubility.
2. Dissolve exactly 1000 mg (1 gram) of the product in 20 ml of chloroform (or absolute alcohol) at room temperature.



3. Pass the solution through a filter paper in a buchner funnel and collect in a falsk the filtrates (that which passes through the filter).

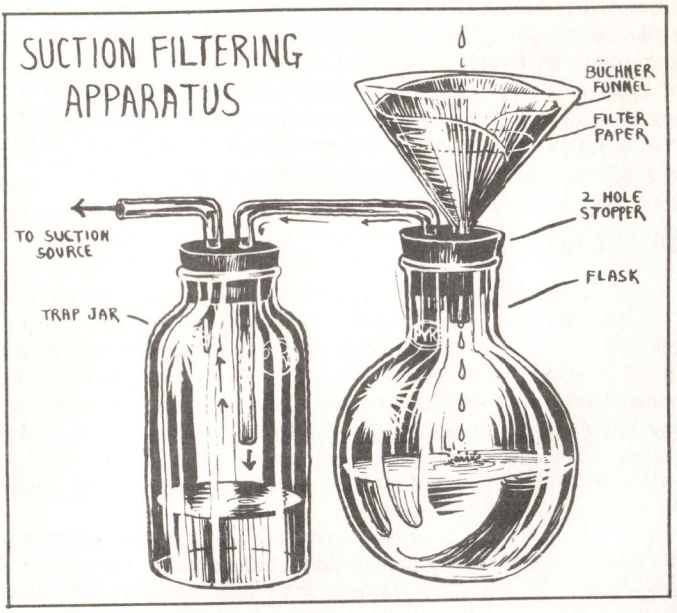
4. The inositol, being insoluble in the solvent, will remain as a residue in the filter. Wash it with fresh solvent, i.e., pour another 20 ml of the solvent over it to make sure that no cocaine remains in the residue and the filter paper. Save the combined filtrates.

5. Place the funnel containing the filter paper and the residue in another flask and wash with two 20 ml portions of hot water. The inositol is soluble in water and will pass through the filter with it.

6. Evaporate the chloroform (or absolute alcohol) filtrates on a hot water bath, and dry the residue overnight in a desicator over magnesium sulfate. Then weigh it.

7. Evaporate the water filtrates on a hot oil bath, and dry the residue overnight in a desicator over magnesium sulfate. Then weigh it.

8. If no other cut than inositol has been used, the dried product from step 6 should be pure cocaine hydrochloride and that from step 7 should be inositol. If the cocaine residue weighs 700 mg and the inositol residue weighs 300 mg, it is quite clear that the cocaine was cut to 70% by the addition of 30% inositol. Actually there should be a slight loss of a few miligrams due to particles irrevocably trapped in the filter paper, but this loss is negligible. The inositol residue can be tested by either the chemical color reaction test or the m.p. (melting point) test. The cocaine residue can be used for snorting, etc. If an m.p. test is conducted on a sample of it and it does not melt at the correct temperature (192-197 degrees C.), there may be some other chloroform-soluble cut such as procaine or lidocaine in it, and further testing may be required.



In some cases the suspected cut may be soluble in a solvent in which cocaine hydrochloride is not soluble. For instance caffeine and benzocaine are both soluble in ether. Free base procaine and free base lidocaine are both soluble in either ether or benzene. Cocaine hydrochloride is insoluble in these solvents. In these cases the procedures are the same except that the filtrates will contain the adulterant and the residue in the filter will be the cocaine. These cocaine residues can be washed through with any cocaine solvent (water, ethanol, methanol, chloroform, or acetone), collected and dried.

The principles of solvent extraction are useful not only for testing, but also for purifying cocaine by washing out the cuts. Details of these processes with solubility charts are given in another book by this author entitled *The Pleasures of Cocaine.*

FLAME TEST

When some pure pharmaceutical grade cocaine hydrochloride is placed on a piece of aluminum foil and a flame is held underneath it, the cocaine will melt and vaporize leaving almost no residue on the foil. If a flame is applied to the vapors, they will ignite. A popular falacy is that none of the common cuts will do this. But this is not so. Mannite, for instance, will do exactly the same thing. Mixed alkaloidal cocaine will evaporate in the same manner with ignitable fumes, but will leave a reddish-brown residue.

Still this is a useful test. Some cuts evaporate with thick fumes and distinctive odors. Lactose, dextrose, and sucrose carmelize and give off a sweet odor like toasting marshmallows. Some cuts leave characteristic residues, or go through observable transformations while melting and evaporating. Other cuts do not melt, vaporize, or decompose at all. In the section describing individual cuts flame test responses are given for each substance. The flame test is not to be confused with the melting point test, which is a more exacting procedure and is discussed elsewhere in this book.

ADULTERANTS (cuts)

A cut is an inexpensive substance which is mixed with cocaine to add bulk so that the dealer makes more money while the customer gets less for his money. There are three basic types of adulterant for cutting cocaine: 1.) Anesthetic cuts, such as procaine and lidocaine, which give the numbing effect of cocaine; 2.) Active cuts, such as methedrine and pemoline, which given central and cerebreal stimulation like cocaine; 3.) Inert cuts, such as lactose and mannite, which merely add bulk and weight, but have no effects. Butacaine sulfate is an exception in that it, like cocaine, causes both numbing and stimulation.

In this section, after describing each cut, pertinent testing data are given, such as m.p. (melting point), flame test response, solubilities, and water glass and bleach test reactions. Also included is a fairly simple chemical test for each substance that will positively identify it.

These tests are essentially designed for identifying relatively pure samples of the substances. Preferably the cuts should be isolated by solvent extraction as described under *Solvent Tests* before conducting the chemical test. If this is not feasible, it may in some cases be necessary to make an estimated compensation for the percentage of the substance present. For example: if the test calls for 5 mg of the suspected cut and the tester suspects that the sample contains about 25% of that substance, it may be necessary to use about 4 times as much of the sample (20 mg). If this is not done a reaction may still occur, but it is likely to be less intense. For instance instead of turning red it may turn pink.

BENZOCAINE

An odorless, white crystalline powder with a slightly bitter taste. It is a synthetic benzoic ester with very low toxicity, but it is poorly soluble in water. For these reasons it is safe for snorting or ingesting (although it may clog the nostrils some), but it is dangerous to inject as it can form blood clots and emboli. It floats on the surface of water. It responds positively but slowly to the bleach water test, lingering on the surface, turning faintly yellow at first and then gradually taking on more orange hues. If water is made acidic, benzocaine will be soluble in it. It is soluble in ethanol, methanol, ether, and chloroform. Its m.p. is 88 - 90 degrees C. **Chemical Test:** Dissolve 10 mg of the substance in 1 ml of water made acidic with 1 drop of dilute hydrochloric acid, add 2 drops of a test solution prepared

by dissolving 10 mg of beta-naphthol in 5 ml of sodium hydroxide solution. If it is benzocaine, the solution will turn deep red, and after standing a while a scarlet precipitate will appear.

BUTACAINE SULFATE

Also called Butyn is a synthetic benzoic ester which comes as a dullish, white powder. It has very little bitterness to it, numbs the tongue swiftly and for a longer time than the other synthetic benzoic esters. It is coming into greater use as a cut because it is the only one of these synthetics that has stimulating properties similar to those of cocaine. It is somewhat more toxic than cocaine and often more irritating to the mucous membranes. It turns brick-red in bleach water. It is soluble in warm ethanol, warm methanol, water, and acetone; very slightly soluble in chloroform; and insoluble in ether. On a flame test it decomposes to a black ash while producing thick fumes with a faintly sulfurous odor like that of burning rubber of gunpowder only milder. Its m.p. is 100-103 degrees C. **Chemical Test:** Prepare a solution of 200 mg of the substance in two ml of water, add an equal portion of sodium hydroxide solution. If it is butacaine sulfate, a colorless oil will precipitate.

CAFFEINE

This methylxanthine is the main active principle in coffee, tea, cola, and several other plants. It occurs as a white crystalline powder or as colorless, needle-shaped, adhering crystals with a silky luster. It is odorless and has a slightly bitter taste. Although it is an excellent central and cerebral stimulant, its effective dose (200-500 mg) is so high that it can hardly add any stimulating qualities to cocaine. Still it is often used as a cut. It is soluble in water, ethanol, methanol, chloroform, and ether. On a flame test it melts vaporizing rather slowly, producing only slight fumes with barely any odor. Its m.p. after drying for four hours at 80 degrees C is 235-237 degrees C. **Chemical Test:** Add one drop of concentrated hydrogen peroxide solution to 10 mg of the substance, then add five drops of 25% hydrochloric acid, and evaporate to dryness. If it is caffeine, there will remain an orange-red residue which dissolves in a few drops of ammonia solution and turns crimson.

CORN STARCH

This common household item requires no description. Because of its inexpensiveness and availability it is often used by household gram dealers for further cutting of cocaine. It is non-toxic, but can clog the nostrils and if injected can cause blood clots and emboli. A simple kitchen test will reveal its presence: Put a few drops of tincture of iodine in a few mililiters of a solution of the substance and shake well. If corn starch is present the solution will turn indigo blue. When heated the color will fade and return upon cooling.

EPHEDRINE SULFATE

This white crystalline alkaloid is derived from the leafless Ephedra plant. It is a sympathetic stimulant and moderate central stimulant. It is used medicinally as a bronchial and nasal decongestant. It is fairly safe and its side effects mostly are the result of its central stimulating properties (dizziness, nervousness, and insomnia). There is no synergistic action between ephedrine and cocaine. It is soluble in water; slightly soluble in ether; and insoluble in chloroform. **Chemical Test:** To a solution of 50 mg of the substance in one ml of water add three drops of R-copper (II) sulfate solution, then add one ml of R-sodium hydroxide solution. If it is ephedrine, it will turn violet. And if an equal volume of butanol is added and the mixture shook, the butanol layer when it separates will be reddish-violet.

INOSITOL

The name refers to any of a group of hexahydroxy-cyclohexanes, but the type used to cut cocaine is the one known as meso-inositol or myo-inositol. It is a non-toxic B vitamin derived from corn and comes as white crystalline granules, which can be purchased inexpensively at most health food stores. Although a hexahydric alcohol like mannitol, it has no laxative effects. It is absorbed rather easily by the membranes and causes no irritation. It has a slightly sweet taste. It is soluble in water, but insoluble in ethanol, methanol, chloroform, and ether. On a flame test it melts at first, then burns or decomposes to a black ash. Its m.p. is 224-227 degrees C. **Chemical Test:** Add six ml of nitric acid to one ml of 1/50 solution of material. Evaporate to dryness on a water bath. Dissolve residue in 0.5 ml strontium nitrate (1/10) solution. Evaporate as before. If it is inositol, residue will be red-purple.

LACTOSE

Also known as milk sugar is a white crystalline powder or mass commercially derived from whey. Because it sells for less than $2.00 a pound in health food stores and pharmacies it is often used to cut cocaine. It is non-toxic, except in rare allergy cases. It tends to clump into a mass when it absorbs moisture. Because of this it will clog the nostrils, which is not only uncomfortable, but also obstructs the absorption of the cocaine. It is not as sweet as sucrose, but sweeter than mannite and inositol. It is soluble in water; somewhat soluble in ethanol and methanol; and insoluble in ether and chloroform. On a flame test it bubbles, carmelizes, then decomposes at 203.5 degrees C to a black ash while producing a thick, sweet smelling smoke. **Chemical Test:** Add five ml of 5% sodium hydroxide solution to five ml of a 1/20 solution of the material and gently warm it. If it is lactose, it will turn yellow then reddish-brown.

LIDOCAINE

Usually encountered as the hydrochloride and also known as lignocaine hydrochloride and Xylocaine, it is the only local anesthetic adulterant commonly used as a cocaine cut that does not belong to the synthetic benzoic ester group. Therefore, it does not respond to the bleach water test. It occurs as an odorless, white crystalline powder with a slightly bitter taste followed by a numbing of the tongue. It has five times the anesthetic potency of procaine, but it is no more toxic than cocaine. It is soluble in water, ethanol, methanol, and chloroform; and insoluble in ether, benzene, and petroleum ether. Its m.p. is 76-79 degrees C. **Chemical Test:** Prepare a solution of 250 mg of the substance in 10 ml of water and add sodium hydroxide solution until pH is alkaline, filter this solution and wash residue in filter several times with water, dissolve 100 mg of the residue in one ml of ethanol or methanol, add 10 drops of 10% cobalt chloride solution, and shake well for two minutes. If it is lidocaine hydrochloride, a bluish-green precipitate will form.

Free base lidocaine is sometimes used as a cocaine cut. It comes as white to pale yellow crystals with a slightly bitter taste and a characteristic odor. It is soluble in ethanol, methanol, chloroform, ether and benzene; and insoluble in cold water. Its m.p. is 66-69 degrees C. **Chemical Test:** Dissolve 100 mg of the substance in one ml of ethanol or methanol add 10 drops of 10% cobalt chloride solution, and shake well for two minutes. If it is free base lidocaine, a bluish-green precipitate will form.

MANNITE

Also known as mannitol and Mennita (trade name) is a white crystalline hexahydric alcohol found naturally in the manna ash tree and several other plants. It is prepared commercially from glucose and comes as a powder, granules or compressed blocks. The latter is the prefered form for coke dealers. It is imported as such from Europe, where it is used as a baby laxative. When used as a cocaine cut it is shaved and chopped with a razor blade. It has the same glistening appearance as cocaine. The powdered form lacks the lustre of the shaved block, but is often dissolved with cocaine and reconstituted by evaporation with good results. Mannite is one of the prefered cuts for coke. It is non-toxic easily absorbed, and does not irritate the membranes. It may have some laxative effect if much is used. It may also cause running nose. It has a slightly sweet taste. It is very soluble in water; slightly soluble in ethanol and methanol; and insoluble in ether. On a flame test it melts and evaporates producing fumes which are hardly visible, but which can be ignited like those of cocaine. It leaves no residue on the foil. Its m.p. is 165-167 degrees C. **Chemical Test:** Saturate one ml water with the material, add 0.5 ml ferric chloride test solution, add 0.25 ml sodium hydroxide solution, shake well. If it is mannitol, the solution will be clear and remain so upon further addition of sodium hydroxide.

METHEDRINE

Properly called methamphetamine hydrochloride, commonly called speed, it is an odorless, bitter tasting, white crystalline powder, which is produced synthetically. It is a potent stimulant of the central and sympathetic nervous systems, cerebreal centers, and metabolic processes. It is illegal except when dispensed by medical prescription. Many of its properties are similar to those of cocaine, but its differences are apparent to the observant tester. It produces euphoric stimulation as does cocaine, but its effects last much longer. It causes smarting and drying of membranes, appetite supression and loosening of the bowels like cocaine, but more severely and for a longer time. It may also cause dizziness, anxiety, cardiac stress and palpitations, aggressive behavior, and insomnia, especially if used immoderately, but again these would be more exaggerated than with cocaine. Unlike cocaine it causes an aching tightness in the neck, jaw, and facial muscles. Also, unlike cocaine, tolerance may develop if immoderate amounts are being used on a daily basis. It is soluble in water, ethanol, methanol, and chloroform; and insoluble in ether. On a flame test it melts and evaporates like cocaine, but at a slightly lower temperature and with considerable sizzling and popping. Also, like cocaine, it leaves no residue. Its m.p. is 171-175 degrees C. **Chemical Test**: Prepare a test solution of two drops of formaldehyde in three ml of sulfuric acid. Put three drops of this mixture on one mg of the substance. If it is methedrine, it will turn brick-red instantly and later change to brown and eventually dull olive-green.

PEMOLINE

This is a synthetically produced hydantoin group chemical which occurs as a fine, shiny, white crystalline powder. It is a cerebral and central stimulant which is devoid of most of the unpleasant side effects of the amphetamines such as muscular tension, membrane drying, cardiac stress, tolerance development, and addiction potential. It is tasteless, odorless, and non-irritating to the mucous membranes. It is legal and inexpensive, and for these reasons has been turning up in samples of black market cocaine. It is slower to take effect than cocaine, but its effects last longer. Its only real drawback is that if a large amount has been taken its effect will linger for many hours after the cocaine stimulation has subsided and insomnia may be experienced. When rubbed between the thumb and fingers it has a silky and almost greasy feeling. It is soluble in ethanol, methanol, benzene, chloroform, and acetone; slightly soluble in hot water; and insoluble in ether, and cold water. When dropped in water it floats on the surface as a shiny crystalline layer. On a flame test it melts producing white fumes with the odor of burning plastic and leaves a brownish-gold stain. Its m.p. is 259 degrees C. **Microscopic Crystal Test:** Treated with picric acid it produces blades and serrated plates; treated with trinitrobenzoic acid it produces long plates (best viewed under polarized light). This test requires a microscope and knowledge of crystalline formations.

The simplest way to detect the presence of pemoline is to familiarize oneself with its appearance as it separates from the cocaine and floats in the water glass test.

PROCAINE

Also known as Novacaine, Allocaine, Ethocaine, Biocaine, Genocaine, Syncaine, and Clinocaine sometimes is found in the free base form, but more often comes as the hydrochloride. The latter usually appears as a white crystalline powder or salt-like crystals. It is a synthetic benzoic ester structurally related to cocaine with a salty, slightly bitter taste. It numbs the tongue like cocaine, but lacks any stimulating properties. It has fairly lox toxicity (about 1/3 that of cocaine) and in the body it breaks down to PABA, which is a B vitamin, and DEAE, another substance normal in the body. Like cocaine it leaves trailers when dropped in water which fools many a customer, but if bleach is added to the water, procaine will turn brick-red, which cocaine will not do. It is soluble in water, ethanol and methanol; very slightly soluble in chloroform; and almost insoluble in ether. On a flame test it melts and evaporates producing thick, white fumes with a mild chlorine odor; the molten matter turns yellow, then becomes dark gold, finally leaving a golden brown stain. Its m.p. is 153-156 degrees C. **Chemical Test:** To a solution of 100 mg of the substance in five ml of water add two drops of dilute sulfuric acid, stir, then add five drops of O.1-N potassium permanganate test solution. If it is procaine hydrochloride, the permanganate's purple-brown tint will disappear.

Free base procaine is a dull white powder with a faintly bitter taste. It numbs the tongue within a few seconds. Because it is poorly soluble in water it tends to clog in the nostrils. Also this makes it dangerous to inject as it can form blood clots and emboli. Otherwise it is pharmacologically similar to the hydrochloride. When dropped in water it does not descend leaving trailers like the hydrochloride, but floats on the surface forming marble-patterned clusters. When dropped in bleach water it floats similarly, but gradually reacts turning first yellowish, then deepening to pale orange and eventually brick-red. After turning color some of the particles may sink below the surface. It is soluble in ethanol, methanol, chloroform, benzene, and ether. On a flame test it melts swiftly with slightly visible fumes and leaves no residue. Its m.p. is 60 degrees C.

QUININE SULFATE

This drug derived from cinchona bark was formerly used as a malaria treatment, but has been replaced by safer drugs. It is an odorless, bitter tasting, white crystalline powder. It is more often used as a heroin cut than a cocaine cut. A large percentage of supposed heroin owerdoses are actually due to the quinine; not the heroin. Some heroin dealers who also deal cocaine have been known to cut their coke with the same quinine that they use to cut their smack. It can cause ringing of the ears, headaches, impared hearing, visual disturbances, dizziness, nausea, diarrhea, and blood pressure

drop. It is especially dangerous when injected. It is soluble in hot ethanol; slightly soluble in hot water; and insoluble in ether, chloroform, and cold water. **Chemical Test:** Dissolve five mg of the substance in five ml of hot ethanol, add two drops of bromine test solution and one ml of ammonia test solution, shake well, and let it stand for a few minutes. If it is quinine, it will gradually turn green.

SUCROSE

This is ordinary cane sugar. Its solubilities and flame test responses are similar to those of lactose. It is somewhat sweeter than lactose, however. **Chemical Test:** Add two ml of dilute sulfuric acid to 100 mg of the substance, heat to boiling, add four ml of 5% sodium hydroxide solution and three ml of Fehling's test solution, heat again to boiling. If it is sucrose, a red precipitate will occur.

TETRACAINE

Found in the hydrochloride form, and also known as pontocaine and amethocaine is an odorless, white crystalline powder with a slightly bitter taste. It has about the same anesthetic potency as cocaine, and more than twice its toxicity. It is a synthetic benzoic ester with no stimulating effects. It numbs the tongue and this numbing lasts longer than that of procaine. It is soluble in ethanol, methanol, and water; and insoluble in benzene and ether. It turns brick-red in bleach water. Its m.p. is 147-150 degrees C. **Chemical Test:** To a solution of 100 mg of the substance in 10 ml of water add 0.2 ml of dilute hydrochloric acid and 0.2 ml of 10% sodium nitrite solution, stir gently, then slowly add this solution to 2 ml of beta-naphthol solution. If it is tetracaine hydrochloride, no color reaction will occur, but a white precipitate will appear.

YOHIMBINE HYDROCHLORIDE

This is a fluffy, white or sometimes pale blue, finely powdered alkaloid derived from the bark of the West African tree *Corynanthe yohimbe.* It is an indole based chemical with subtle but definite stimulant and psychoactive properties. It also possesses what might fairly be called aphrodisiac properties in that it is a serotonin inhibitor and stimulant of the spinal ganglia which produce erection. It is a pleasant enough drug for most people, but may present dangers in certain cases. If a person suffers from existing damage to the heart, liver or kidneys, this substance may antagonize the condition. It can be dangerous to take this drug with alcohol and especially with amphetamines as it is synergistically potentiating with them. Persons who do so will most likely suffer palpations of the heart, difficulty in breathing, chest pain, severe blood pressure drop, and shivers. These symptoms usually pass after an hour or so, but are extremely uncomfortable. Since several underground publications have given reports on this legal drug it has been showing up occasionally in analysis of street cocaine samples. It is soluble in hot water, slightly soluble in cold

water, cold ethanol and cold methanol; and insoluble in ether, and acetone. On a flame/foil test it melts producing thick white fumes with a characteristic indole odor faintly like moth flakes, as it evaporates the mass turns brownish-gold finally leaving a black stain. Its m.p. is 302 degrees C. **Chemical Test:** Add three drops of concentrated nitric acid to 10 mg of the substance. If it is yohimbine hydrochloride, it will turn dark green then fade to yellow. Then upon addition of two ml of 10% potassium hydroxide in ethanol it will turn cherry-red.

TESTING FOR PRESENCE OF COCAINE

Dissolve 100 mg of the sample in 5 ml of water, and add 5 drops of chromium trioxide test solution which is prepared by dissolving 500 mg of chromium trioxide in 10 ml of water. If the sample is cocaine hydrochloride, a yellow precipitate will occur. If the mixture is heated slightly (preferably on a water bath), the precipitate will redissolve. If one ml of hydrochloric acid is added, an orange-yellow precipitate will occur.

TO ESTIMATE PURITY OF SAMPLE

Dissolve 100 mg of the sample in 5 ml of water, add three drops of dilute sulfuric acid, stir, add one drop of permanganate test solution (prepared by dissolving 100 mg of potassium permanganate in 10 ml of water). If the cocaine hydrochloride sample is fairly pure, the mixture will have a pink tint that will gradually fade, but not entirely disappear during the next 30 minutes. If it does not take on this pink tint, or if the tint disappears before 30 minutes has elapsed, the sample is probably not very pure. To make a rough estimate of its purity use progressively stronger solutions of the sample. For example: if 150 mg of 5 ml is required to obtain a pink tint that will not totally fade before 30 minutes, the sample was about 60% pure; if 200 mg is required, the sample was 50% pure. If much more than 100 mg of actual cocaine has been dissolved in the water and the test is conducted, rhombic plates will precipitate. When heated these will decompose. If there is an odor of bitter almonds during decomposition, this indicates the presence of cinnamyl-cocaine. It is then probable that the sample is mixed alkaloidal rather than pharamaceutical cocaine. In that case the following test will determine if this is so:

TO DISTINGUISH PHARMACEUTICAL FROM MIXED ALKALOIDAL COCAINE

Prepare a saturated solution of the cocaine hydrochloride in a minimum amount of water, add to it a few drops of concentrated ammonia solution, and stir vigorously for 5 minutes. If the sample is pharmaceutical cocaine, crystals will deposit on the stirring rod and the walls of the beaker. If it is mixed alkaloidal cocaine, instead of producing crystals the solution will turn milky because the other alkaloids are converted into

their free bases and separate out as oily drops. This is not a test for the purity of cocaine bought on the black market. It only tells whether the product contains the other coca alkaloids or not. It takes a substantial measure of cocaine to carry out this test. The cocaine and companion alkaloids can be salvaged, however, by treating the solution dropwise with hydrochloric acid until the crystals or oily droplets redissolve, neautralizing dropwise with very dilute ammonia solution, evaporating on a hot oil bath, washing through a filter paper with acetone or chloroform, evaporating on a hot water bath, and drying overnight in a desiccator.

MELTING POINT TEST

Throughout this book we have given melting points or melting ranges of cocaine and the various cuts. This is a most exacting test which requires special equipment. Melt point test kits are available from scientific equipment supply houses and usually include instructions for use. A complete description of the technique is given in *The Pleasures of Cocaine* by this same author. Simply expressed, it involves packing a glass capillary tube with a heat dried sample of the substance to be tested, immersing it in a silicon oil bath with a thermometer, gradually raising the temperature of the bath until the material melts or decomposes, and noting at what exact temperature this occurs. Pure cocaine hydrochloride should melt somewhere between 192 and 197 degrees C. If it contains a cut, its melting point may deviate widely. Sometimes the cut may be observed melting out at a lower temperature if it has a vastly lower m.p. than that of cocaine. But usually it simply causes a deviation of the cocaine m.p. To properly test the m.p. of the cut it is necessary in most cases to isolate the cut by solvent extraction. This process is described in detail in this book under **Solvent Test.**

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